

- 30 -

### THE CLAIMS

1. A cleaning system constructed for removing hair clipping debris from the interior of a hair cutting end of an electric shaver, said system comprising
- 5 A. a support member constructed for receiving and retaining the hair cutting end of an electric shaver;
  - B. a fluid retaining zone positioned in cooperative association with the support member and constructed for retaining a cleaning fluid therein;
  - 10 C. a pump assembly communicating with the holding zone and constructed for withdrawing cleaning fluid from the holding zone and delivering the cleaning fluid through a fluid delivery conduit; and
  - D. a fluid delivery conduit
    - 15 a. connected to the pump assembly,
    - b. incorporating at least one delivery port formed therein, and
    - c. extending from the pump assembly to the support member holding zone for being positioned in cooperative, aligned, fluid delivering relationship with a portal formed in the electric shaver;
- whereby cleaning fluid is withdrawn from the fluid holding zone and delivered
- 20 directly into the interior of the electric shaver through the shaver portal for providing fluid flow through the interior of the hair cutting end of the electric shaver for dislodging and flushingly removing the hair debris therefrom.

- 31 -

2. The cleaning system defined in Claim 1, and further comprising a housing constructed for containing the holding zone, the pump assembly, and the fluid delivery conduit in operational relationship and incorporating the support member for positioning and holding the portal of shaver in fluid receiving relationship with the delivery port of the fluid delivery conduit, assuring the flow of the cleaning fluid directly into the interior of the shaver.

3. The cleaning system defined in Claim 2, wherein said housing further comprises a base portion incorporating the cleaning fluid holding zone, and an upper portion removably mountable to the base portion for enabling easy access to the holding zone.

4. The cleaning system defined in Claim 3, wherein said base portion is further defined as comprising a bottom surface, a wall member peripherally surrounding the bottom surface in secure interengagement therewith, and a cover mounted to the inside surface of the wall member in juxtaposed, spaced relationship to the bottom surface defining the cleaning fluid holding zone therebetween.

5. The cleaning system defined in Claim 4, wherein said cover further comprises an enlarged filter assembly receiving portal.

- 32 -

6. The cleaning system defined in Claim 5, and further comprising a filter assembly incorporating

- 5
- A. a support plate constructed for removable engagement in the receiving portal of the cover,
- B. an enlarged aperture formed in the support plate for enabling cleaning fluid to be rapidly passed therethrough, and
- 10 C. a filter member defining an enclosed zone with one open end affixed to the support plate, thereby requiring all of the cleaning fluid entering the portal of the support plate to pass through the filter member before returning to the holding zone, thereby enabling all of the debris contained in the cleaning fluid to be removed.

7. The cleaning system defined in Claim 6, wherein said filter assembly further comprises a diverted plate formed in the support plate in juxtaposed, spaced  
15 relationship to the enlarged aperture and positioned below the portal for receiving the debris laden cleaning fluid and forcing the debris and cleaning fluid outwardly therefrom.

8. The cleaning system defined in Claim 5, wherein the cover of the based portion incorporates a plurality of alignment apertures formed therein and the  
20 upper portion is further defined as incorporating the pump assembly, the support member constructed for receiving and retaining the hair cutting end of the electric shaver, and a base plate forming the lower surface of the upper member, said base plate incorporating a plurality of alignment posts extending therefrom and positioned for telescopic engagement in the receiving portals formed in the cover of the  
25 base portion.

- 33 -

9. The cleaning system defined in Claim 8, wherein the base portion of the housing further comprises at least one upstanding hook member formed on the cover thereof and the upper portion comprises at least one movable latch member positioned for cooperative engagement with the hook member of the base portion for providing latched interengagement of the upper portion with the base portion and easy disconnection and removal of the upper portion from the base portion.

10. The cleaning system defined in Claim 6, wherein the support member is further defined as comprising an enlarged shaver receiving zone incorporating a plurality of mounting fins positioned for peripherally surrounding and supportingly maintaining the hair cutting end of the electric shaver in the precisely desired position for enabling the delivery port of the fluid delivery conduit to be positioned in cooperative, aligned, fluid delivering relationship with the portal formed in the electric shaver.

11. The cleaning system defined in Claim 10, wherein the electric shaver incorporates a plurality of fluid receiving portals formed in the outer surface thereof for enabling fluid delivered therethrough to enter directly into the hair pocket of the shaver, and said support member further comprises a fluid distribution manifold mounted in the shaver receiving zone in cooperating relationship with the mounting fins, with said manifold incorporating a plurality of fluid delivery nozzles positioned for aligned, cooperative, fluid delivering relationship with the plurality of portals formed in the electric shaver, whereby the cleaning fluid passing through the distribution manifold is fed through the nozzles and the portals of the electric shaver directly into the hair pocket of the shaver.

- 34 -

12. The cleaning system defined in Claim 11, wherein said support member is further defined as comprising fluid collection means for receiving the cleaning fluid and hair debris exiting from the shaver and delivering the cleaning fluid and hair debris to the filter assembly.

5 13. The cleaning system defined in Claim 12, wherein said fluid collection means is further defined as comprising a base surface formed in the enlarged shaver receiving zone, positioned below the hair cutting end of the shaver and incorporating an enlarged aperture formed therein, with said base surface being sloped, for directing all of the fluid and debris coming in contact therewith directly to the  
10 enlarged aperture.

14. The cleaning system defined in Claim 13, wherein said enlarged aperture formed in the base surface is further defined as being directly aligned with the filter assembly for enabling all of the fluid and debris passing through said enlarged aperture to be delivered directly to said filter assembly.

15 15. The cleaning system defined in Claim 14, wherein said plurality of mounting fins formed in the shaver receiving zone of the support member is further defined as being mounted on the base surface in cooperating relationship with an upstanding boss member positioned for providing further support and alignment of said electric shaver with the nozzles of the manifold.

20 16. The cleaning system defined in Claim 11, wherein said fluid distribution manifold is further defined as comprising a first section having a substantially U-shaped cross-section incorporating a plurality of nozzles formed therein and defining an internal channel through which said cleaning fluid travels, and a cover securely mountable to the first section for sealingly closing the first section, thereby  
25 forming a completely enclosed, sealed, leak free manifold construction.

- 35 -

17. The cleaning system defined in Claim 16, wherein said nozzles formed on the first section are further defined as comprising rounded outer surfaces, assuring easy, aligned engagement of said nozzles with the portals of the shaver.

5 18. The cleaning system defined in Claim 17, wherein said fluid distribution manifold is further defined as comprising an overall U-shape constructed for peripherally surrounding and easily engaging the outer surface of the electric shaver, with the terminating ends of said distribution manifold being flexibly movable for assuring rapid, easy mounted engagement thereof with said electric  
10 shaver.

19. The cleaning system defined in Claim 1, wherein said system further comprises

E. a fan assembly constructed for drawing ambient air through an inlet portal and delivering a continuous flow of air to the electric shaver  
15 when so desired.

20. The cleaning system defined in Claim 19, wherein said cleaning system further comprises

F. a shaver holding post cooperatively associated with the support member and constructed for receiving and engaging the terminating  
20 end of the electric shaver for stabilizing the electric shaver and enabling electrical pins formed in the electric shaver to be electrically engaged.

- 36 -

21. The cleaning system defined in Claim 20, wherein said support member is further defined as incorporating a pivotable arm member mounted therein and incorporating two spring biased posts positioned for automatically engaging and electrically contacting the pins of the electric shaver when the electric shaver is arcuately pivoted into engagement therewith.

22. The cleaning system defined in Claim 21, wherein said support member is further defined as incorporating spring members cooperatively associated with the pivotable arm for continuously biasing the pivotable arm into a shaver contacting position, whereby any displacement of the pivotable arm by the shaver during its mounting operation is automatically compensated.

23. The cleaning system defined in Claim 22 and further comprising an integrated circuit mounted therein and constructed for providing cyclical, controlled operation of the pump assembly, the shaver, and the fan assembly.

24. The cleaning system defined in Claim 23, wherein said integrated circuit also controls recharging of the electric shaver independently of the cleaning thereof.

25. The cleaning system defined in Claim 24, wherein said integrated circuit is further defined as cyclically operating the pump assembly for delivering and ceasing the delivery of cleaning fluid directly to the hair pocket of the electric shaver for a period of time ranging between about two minutes and eight minutes, followed by activating the fan assembly for the delivery of air flow to the shaver for between about 15 and 22 minutes.

- 37 -

26. The cleaning system defined in Claim 25, wherein said integrated circuit is further defined as being responsive to the receipt of an activation signal prior to initiating the cleaning cycle.



- 38 -

27. A cleaning system constructed for removing debris from the interior of an electric shaver, said system comprising:

A. an electric shaver comprising

- a. a hair pocket defining the interior zone of the hair cutting end thereof,
- b. at least one cutting blade mounted in the hair pocket and constructed for cutting movement relative to a cooperating foil member,
- c. at least one foil member mounted to the shaver at the hair cutting end thereof in cooperative association with the cutting blade, and
- d. at least one portal formed in the hair cutting end of the shaver and extending from the outer surface of the shaver into the interior of the hair pocket;

B. a housing constructed for receiving and supportingly retaining the shaver in a cleaning positioned and comprising

- a. a support member constructed for receiving the hair cutting end of the shaver and,
- b. a fluid retaining zone formed in the housing for receiving and retaining cleaning fluid therein,
- c. a pump assembly mounted in the housing and positioned for withdrawing cleaning fluid from the retaining zone and forcing the cleaning fluid through a fluid delivery conduit,
- d. a fluid delivery conduit connected to the pump assembly and extending therefrom to the support member, and incorporating at least one exit nozzle formed therein, and
- e. an exit nozzle being mounted in aligned, fluid delivering engagement with the portal formed in the hair cutting end of the electric shaver, enabling the cleaning fluid to be forced

- 39 -

directly into the hair pocket of the electric shaver, directly contacting the surfaces of the hair pocket, the cutting blade and the cutting foil mounted therein;

whereby cleaning fluid is withdrawn from the fluid holding zone and delivered  
5 directly into the interior of the electric shaver through the shaver portal for providing fluid flow through the interior of the hair cutting end of the electric shaver for dislodging and flushingly removing the hair debris therefrom.

28. The cleaning system defined in Claim 27, wherein said system further comprises:

10 C. a filter assembly mounted in the housing between the support member and the fluid retaining zone and constructed for enabling all of the cleaning fluid and hair debris emanating from the electric shaver to flow therethrough prior to returning the cleaning fluid to the fluid retaining zone.

- 40 -

29. The cleaning system defined in Claim 28, wherein said system further comprises:

5 D. a fan assembly constructed for drawing ambient air through an inlet portal and delivering a continuous flow of air to the electric shaver when so desired;

10 E. a shaver holding post cooperatively associated with the support member and constructed for receiving and engaging the terminating end of the electric shaver for stabilizing the electric shaver and enabling electrical pins formed in the electric shaver to be electrically engaged, and incorporating

15 a. a pivotable arm member mounted therein and incorporating two spring biased posts positioned for automatically engaging and electrically contacting the pins of the electric shaver when the electric shaver is arcuately pivoted into engagement therewith, and

20 b. spring members cooperatively associated with the pivotable arm for continuously biasing the pivotable arm into a shaver contacting position, whereby any displacement of the pivotable arm by the shaver during its mounting operation is automatically compensated; and

F. an integrated circuit mounted therein and constructed for providing cyclical, controlled operation of the pump assembly, the shaver, and the fan assembly.

25 30. The cleaning system defined in Claim 29, wherein said integrated circuit also controls recharging of the electric shaver independently of the cleaning thereof.

- 41 -

31. The cleaning system defined in Claim 30, wherein said electric shaver is further defined as comprising a rotary shaver incorporating three cooperating, circular shaped cutting blade assemblies and three, circular shape foil members, each associated with one circular shaped cutting blade assembly.

5           32. The cleaning system defined in Claim 28, wherein the support member formed in the housing is further defined as comprising an enlarged shaver receiving zone incorporating a plurality of mounting fins positioned for peripherally surrounding and supportingly maintaining the hair cutting end of the electric shaver in the precisely desired position for enabling the delivery port of the fluid delivery  
10 conduit to be positioned in cooperative, aligned, fluid delivery relationship with the portal formed in the electric shaver.

          33. The cleaning system defined in Claim 32, wherein the electric shaver incorporates a plurality of fluid receiving portals formed in the outer surface thereof for enabling fluid delivered therethrough to enter directly into the hair pocket of the  
15 shaver, and said support member further comprises a fluid distribution manifold mounted in the shaver receiving zone in cooperating relationship with the mounting fins, with said manifold incorporating a plurality of fluid delivery nozzles positioned for aligned, cooperative, fluid delivering relationship with the plurality of portals formed in the electric shaver, whereby the cleaning fluid passing through the  
20 distribution manifold is fed through the nozzles and the portals of the electric shaver directly into the hair pocket of the shaver.

- 42 -

34. The cleaning system defined in Claim 33, wherein the filter assembly is further defined as comprising:

- a. a support plate constructed for being removably mountable in the housing,
- 5 b. an enlarged aperture formed in the support plate for enabling cleaning fluid to rapidly pass therethrough, and
- c. a filter member defining an enclosed zone with one open end, said open end being affixed to the support plate, thereby requiring all of the cleaning fluid entering the portal of the support plate to pass through the filter member before return-  
10 ing to the holding zone, enabling all of the debris contained in the cleaning fluid to be removed therefrom.

35. The cleaning system defined in Claim 34, wherein said filter assembly further comprises an inverted V-shaped diverter plate supportingly retained by the  
15 support plate in juxtaposed, spaced, relationship thereto, below the enlarged aperture for receiving the debris laden cleaning fluid and forcing the debris and cleaning fluid outwardly towards the filter member.

36. The cleaning system defined in Claim 35, wherein the support member is further defined as comprising a fluid receiving surface positioned below  
20 the hair cutting end of the shaver for receiving the debris laden cleaning fluid exiting therefrom and constructed for rapidly directing the debris laden cleaning fluid to the filter assembly.

37. The cleaning system defined in Claim 31, wherein said support member further comprises a plurality of upstanding bosses formed therein in  
25 cooperating relationship with three heads of the rotary shaver for vertically displacing the heads of the shaver when said shaver is fully mounted therewith.

- 43 -

38. The cleaning system defined in Claim 31, wherein each of the circular shaped cutting foils is peripherally surrounded by a ring member which incorporates a plurality of depressions or knurled zones formed therein for establishing a flow path for the cleaning fluid and debris exiting the shaver.

5           39. The cleaning system defined in Claim 31, wherein each cutting blade incorporates a separate and independent rotating shaft for causing said blade member to rotate and said shaver further incorporates a plurality of outwardly extending arms or paddles formed on the rotating shaft for increasing the turbulence of the cleaning fluid flowing through the hair pocket.

10           40. The cleaning system defined in Claim 30, wherein said shaver is further defined as comprising a foil shaver construction, with said foil shaver incorporating a plurality of apertures formed on the outer surface thereof and extending therefrom into the hair pocket of the shaver.

- 44 -

41. A cleaning system constructed for removing hair clipping debris from the interior of a hair cutting end of an electric shaver, wherein said shaver incorporates a plurality of portals formed in the outer surface of the hair cutting end, with said portals extending from the exterior surface to the interior of the hair cutting end, said system comprising:
- A. a support member constructed for receiving and retaining the hair cutting end of an electric shaver;
  - B. a fluid retaining zone positioned in cooperative association with the support member and constructed for retaining a cleaning fluid therein;
  - C. a pump assembly communicating with the holding zone and constructed for withdrawing cleaning fluid from the holding zone and delivering the cleaning fluid through a fluid delivery conduit;
  - D. a fluid delivery manifold
    - a. connected to the fluid delivery conduit for receiving the cleaning fluid flowing therethrough and distributing the cleaning fluid throughout said manifold,
    - b. incorporating a plurality of nozzles formed along said manifold, with each of said nozzles being positioned in cooperative, aligned, fluid delivering relationship with one portal of said shaver;
- whereby cleaning fluid is withdrawn from the fluid holding zone and delivered directly into the interior of the electric shaver through the portals formed in the shaver for providing fluid flow throughout the interior of the hair cutting end of the shaver, dislodging, flushing and removing the hair debris therefrom.

- 45 -

42. A cleaning system constructed for removing hair clipping debris from the interior of a hair cutting end of an electric shaver, wherein said shaver incorporates a plurality of portals formed in the outer surface of the hair cutting end, with said portals extending from the exterior surface to the interior of the hair cutting

5 end, said system comprising:

A. a support member constructed for receiving and retaining the hair cutting end of an electric shaver;

10 B. a fluid retaining zone positioned in cooperative association with the support member and constructed for retaining a cleaning fluid therein;

C. a pump assembly communicating with the holding zone and constructed for withdrawing cleaning fluid from the holding zone and delivering the cleaning fluid through a fluid delivery conduit;

15 D. a fluid delivery conduit connected to the pump assembly, incorporating a plurality of delivery ports formed therein, and extending from the pump assembly to the support member holding zone for being positioned in cooperative, aligned, fluid delivering relationship with the portals formed in the electric shaver;

20 E. a shaver holding post cooperatively associated with the support member and constructed for receiving and engaging the terminating end of the electric shaver for stabilizing the electric shaver and enabling electrical pins formed in the electric shaver to be electrically engaged, and incorporating

25 a. a pivotable arm member mounted therein and incorporating two spring biased posts positioned for automatically engaging and electrically contacting the pins of the electric shaver when the electric shaver is arcuately pivoted into engagement therewith, and



- 46 -

5

- b. spring members cooperatively associated with the pivotable arm for continuously biasing the pivotable arm into a shaver contacting position, whereby any displacement of the pivotable arm by the shaver during its mounting operation is automatically compensated; and
- F. an integrated circuit mounted therein and constructed for providing cyclical, controlled operation of the pump assembly, and the shaver.

- 47 -

43. A method for cleaning hair debris from the hair pocket, cutting blades, and cutting foils of an electric shaver, with the shaver incorporating at least one aperture formed therein and extending from the outside surface directly into the hair pocket, said method comprising the steps of:

- 5           A.     feeding cleaning fluid from a holding zone through a delivery conduit communicating directly with the aperture of the shaver;
- B.     flushing the hair pocket, cutting blades, and cutting foil with the cleaning fluid for dislodging the hair debris from the surfaces thereof;
- 10          C.     allowing the hair debris and cleaning fluid to drain from the shaver through the cutting foils;
- D.     collecting the hair debris and cleaning fluid exiting from the shaver;
- E.     filtering the collected hair debris out of the cleaning fluid, and
- F.     returning the filtered cleaning fluid to the holding zone.
  
- 15          44.    The method defined in Claim 43, comprising the additional step of:
  - G.     repeatedly cycling the cleaning fluid flow into the shaver for optimizing the cleaning and removal of the hair debris therefrom.
  
- 45.    The method defined in Claim 44, comprising the additional steps of:
  - 20       H.     repeatedly cycling the shaver between an ON mode and an OFF mode during the cleaning process; and
  - I.     blowing ambient air over the shaver after the cleaning cycle is completed for drying the shaver.